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Children and adolescents coordinate group and moral concerns within different goal contexts when allocating resources

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Coordinating complex social and moral concerns when allocating resources is a key issue in late childhood and early adolescence. This study explored resource allocation in three goal contexts that required children to focus to differing degrees on moral and group concerns. Children (9–11-years, M^{age} = 9.84, n = 190) and adolescents (14–16-years, M^{age} = 14.92, n = 154) were informed their school peer group held an in-group norm (competition, cooperation). Participants allocated resources between their in-group and an outgroup within one of three goal contexts (prosocial, learning-focused, and group-focused). Participants allocated in favour of their in-group to achieve a prosocial goal but attenuated this when the goal was focused on learning and cooperation. Adolescents, more than children, reasoned about the goals of resource allocation to justify their decisions. From 9 years old, children begin to coordinate peer group norms and goal information when deciding how to allocate resources within intergroup contexts.

Statement of Contribution

What is already known on this subject?

- In-group norms of competition and cooperation can guide resource allocation.
- Children are concerned with achieving prosocial goals.

What the present study adds?

- Children and adolescents use in-group biased resource allocation to achieve a prosocial goal.
- When the goal is to learn, children do not express in-group bias.
- A competitive in-group norm can supersede the goal of an allocation decision.

Background

With age, intergroup resource allocation decisions become more complex not only in terms of *who* we are allocating to, or *what* we are allocating, but also in terms of *why* we are allocating. Recent work has examined how group identities (the 'who' of this equation) (McAuliffe, Raihani, & Dunham, 2017; McGuire, Manstead, & Rutland, 2017),

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and resource type effect allocation decisions (Rizzo, Elenbaas, Cooley, & Killen, 2016). A next step is to explore children's resource allocation when the goal of the allocation decision differs (i.e., why the resources must be allocated).

The present study examined this by asking children to allocate resources between groups in three different goal contexts (i.e., the 'why' of resource allocation) that were designed to make moral and group concerns salient to different degrees. These included a prosocial context (multi-faceted concerns salient), a learning-focused context (moral concerns salient), and a group-focused context (group concerns salient). We also varied the focus of children's group concerns by manipulating an in-group norm. Given research that has demonstrated the importance of competitive and cooperative group norms in intergroup resource allocation decisions (McGuire, Elenbaas, Killen, & Rutland, 2019; McGuire, Rizzo, Killen, & Rutland, 2018), here we asked participants to allocate resources across three goal contexts, while manipulating an in-group norm of competition or cooperation within each context.

Coordinating moral and group concerns

The Social Reasoning Developmental model (SRD; Rutland & Killen, 2017; Rutland, Killen, & Abrams, 2010) proposes that between middle childhood and early adolescence individuals learn to coordinate moral (e.g., fairness) with group concerns (e.g., group distinctiveness) when making decisions in intergroup contexts. The model also contends that the relative importance of these concerns varies by context. In some situations, morality is given priority. For example, outgroup members who support equality are evaluated more positively than in-group members who support biased allocation (Mulvey, Hitti, Rutland, Abrams, & Killen, 2014).

In other situations, group concerns can be given priority over morality. Previous research has shown that in-group norms of competition and cooperation can make different moral and group concerns more or less salient which is in turn related to lower or higher in-group bias (e.g., McGuire *et al.*, 2017). Children and adolescents coordinate intergroup information (i.e., norms) with broader moral concerns (i.e., fairness) when allocating resources. In-group norms do not always lead to unequal resource allocation as they can also attenuate bias. For example, recent work has documented that disadvantaged adolescents will allocate to rectify an inequality, but only when their group endorses an equity norm (McGuire *et al.*, 2019). Together, this work documents that children from 7 years old utilize competitive and cooperative peer group norms to determine when in-group bias is most appropriate.

Findings from the SRD perspective suggest that the coordination of moral and group-level domain concerns depends on how contextually salient these different concerns are. This salience is influenced by cooperative and competitive in-group norms from middle childhood onwards. The present study goes beyond existing literature to examine how different *goals* make these domain concerns salient, and in turn how this interacts with peer group norms of competition and cooperation. Some goal contexts give priority to group concerns, while others emphasize moral concerns. Other multi-faceted goals require children to coordinate (i.e., consider simultaneously and reconcile) both moral and group concerns. In this study, we asked children to allocate resources between groups in one of three goal contexts (prosocial, learning-focused, and group-focused) that varied in how much they required the coordination of group and moral concerns while also manipulating a group norm of either competition or cooperation.

Goal contexts

Prosocial goal context

Prosocial goals guide behaviour from middle childhood and can be achieved through allocating resources to needy others (Paulus, 2014; Rizzo, Elenbaas, Cooley, & Killen, 2016). Children (9–11 years old) allocate a greater share of resources to their in-group when prosocial issues (e.g., helping needy others) are made salient (McGuire *et al.*, 2018). This finding fits with research suggesting that children are motivated to engender a distinct moral identity for their in-group by differentiating themselves from other groups in terms of prosociality. For example, 5-year-olds allocate more stickers to a peer when their decision is visible to the recipient (Leimgruber, Shaw, Santos, & Olson, 2012). Similar effects are observed in peer group contexts when there is a possibility of being singled out as the most or least generous group member (Engelmann *et al.*, 2018; Rapp *et al.*, 2019).

Here, participants in the prosocial goal context were informed that their group would be aiming to sell the most art possible to aid an animal charity cause. We expected that this goal context would make multi-faceted domain concerns of morality (i.e., welfare of animals) and group identity (i.e., distinctiveness of group as most prosocial) salient. Based on studies that have shown children's resource allocation to be influenced by reputational concern (Engelmann *et al.*, 2018; Rapp *et al.*, 2019), we anticipated that in-group biased resource allocation would be used to achieve optimal group distinctiveness in terms of prosociality. We did not expect that allocation would differ between the in-group norm conditions. In the prosocial context, in-group serving allocations are aligned with a competitive in-group norm as they both benefit the group and promote the group's reputation as a moral entity (Rapp *et al.*, 2019). Similarly, in-group serving allocation can still be justified given that the goal of the allocation is a prosocial cause (Paulus, 2014). Therefore, children in the prosocial goal context were expected to allocate more resources to their in-group compared to the outgroup in all norm conditions (Hypothesis 1: H1).

Learning-focused goal context

In the learning-focused goal context, participants were told about an intergroup art exhibition focused on education with no competitive motivation. Here we expected that moral concerns would be more salient than group concerns. Research has documented that between 5–6 years and 10–11 years children negatively evaluate inequalities in access to school supplies and reason about the importance of equal access to such supplies (Elenbaas, Rizzo, Cooley, & Killen, 2016). This suggests that educational contexts make moral concerns of equality more salient. Based on this, in the learning-focused goal context we expected that participants would allocate equally as moral concerns (i.e., equal access to education) should be given priority. However, this may be less likely when the in-group norm is competitive. When the goal context was learning-focused, we expected participants to allocate resources equally between the groups, except when the in-group norm was competitive (Hypothesis 2: H2).

Group-focused goal context

The group-focused context presented participants with an intergroup arts competition that made group concerns salient. In line with previous research (McGuire *et al.*, 2017),

we expected that in-group bias would be used in order to achieve group success, especially when there was also a competitive in-group norm. In this goal context, participants were expected to allocate more resources to their in-group, especially when the peer group held a competitive norm (Hypothesis 3: H3).

Social reasoning & norm evaluation

Research from the SRD perspective has made important contributions to the developmental resource allocation literature by focusing on children's reasoning and moral evaluations around different allocation strategies (Elenbaas *et al*., 2016; McGuire *et al*., 2019; Mulvey *et al*., 2014). In line with this approach, we asked participants to evaluate their in-group norm. Based on children's propensity towards prosocial behaviour from early childhood (Paulus, 2014) and their concerns for fairness in competitive contexts (McGuire *et al*., 2018), we anticipated that participants would evaluate a cooperative in-group norm as more 'okay' than a competitive in-group norm (Hypothesis 4; H4).

This study also assessed participants' social reasoning by asking them to justify their resource allocations decisions. Justifications typically differ both by age *and* as a function of how participants choose to allocate (i.e., equally or unequally). Adolescents have been shown to make greater reference to contextual issues (e.g., the fairness of the competition context) when justifying allocations whereas children reference generic moral or group concerns (e.g., the importance of equal distribution or getting the most for their group; McGuire *et al*., 2017; McGuire *et al*., 2018). We contend this is due to adolescents' greater exposure to complex intergroup context compared to children, giving them a more advanced understanding of group dynamics in context (Rutland & Killen, 2017). In line with SRD approach and existing work (McGuire *et al*., 2019) when participants allocated *equally*, we expected adolescents to use more contextual reasoning (e.g., ensuring a fair competition, or the goal context). In contrast, children who allocated equally were expected to primarily use generalizable moral reasoning (e.g., fairness or equality). When participants allocated in favour of their in-group, we expected that participants of all ages would use group-based reasoning (e.g., group distinctiveness) (Hypothesis 5: H5).

Method

Participants

Power analysis for an ANOVA with 12 groups was conducted in G*Power to determine sample size using an alpha of 0.05, power of 0.95, and a medium effect size (f = .025) (Faul, Erdfelder, Lang, & Buchner, 2007). Based on these assumptions, the desired sample size was 251 participants. Testing was conducted in large classroom groups with approximately 30 participants working individually at the same time on computers or tablets. The survey was hosted online using Qualtrics (Qualtrics, Provo, UT). As participants were asked to read and work alone, we anticipated participant dropout through failure to correctly answer a comprehension check question especially among younger participants. Therefore, we initially recruited 461 participants from schools in a metropolitan area in the South East of the United Kingdom. As anticipated, 117 participants were excluded for failing to accurately answer an in-group norm manipulation check question, leaving a final n of 344 for analysis.

Participants included 190 (97 female) 9- to 11-year-old children (M^{age} = 9.84, *SD* = .65), and 154 (87 female) 14- to 16-year-old adolescents (M^{age} = 14.92, *SD* = .74). The sample consisted of approximately 42% White British, 20% South East Asian British, 19% Black British, and 16% other ethnic minority backgrounds, with 3% of participants opting to withhold ethnic information. Participants attended schools serving lower to middle-class socioeconomic (SES) populations. Parental consent and child assent were obtained for all participants.

Procedure

Group membership phase

Participants were asked to imagine they would be taking part in an arts event involving their own school and another local school. They were shown an illustration of four matched gender peers representing their school group ('in-group') and another group from a local school ('outgroup'), and picked a group logo, colour, and name in order to instil feelings of in-group affiliation (McGuire, Rutland, & Nesdale, 2015; Nesdale & Dalton, 2011).

In-group norm

An in-group norm was established by telling participants that their group had a secret message for its members. This secret message technique has previously been used to communicate in-group norms to participants in this age range (McGuire *et al*., 2019; Nesdale & Dalton, 2011). This message read as follows:

> '*Hello, we're really happy you're going to be in our group for this drawing event. We just have one rule if you're going to be in our group, and that is you should try and make our school do better than the other school groups*. . .'
>
> (Competitive in-group norm) '. . .*and never help the other groups in the event*'.
>
> (Cooperative in-group norm) '. . .*but also help the other groups in the event*'.

The norm focused on group success in both conditions to ensure they were believable given expectations for in-group support in competitive situations (Bauer, Cassar, Chytilová, & Henrich, 2013; Bowles, 2006).

Participants answered a comprehension check question to ensure understanding: 'Based on what you just read, does your team want to help other teams in the competition?' (Yes/No). Participants who failed to understand their in-group norm were excluded from the final analyses (n = 117, 97 children and 20 adolescents; see supplemental materials for further details).

Goal context

Participants were randomly assigned to one of three goal context conditions and read a message about the event their group would be taking part in.

In the prosocial condition, participants read:

> 'You will be taking part in the UK Charity Art Event. The art made will be used for a charity event to raise money for animal shelters across the UK'.

In the learning-focused condition, participants read:

> 'You will be taking part in the UK Art Exhibition. The art will be used as part of an exhibition of lots of different schools across the country where everyone can display their art and learn a lot'

In the group-focused condition, participants read:

> 'You will be taking part in the UK Art Competition. This is the highest level of art competition in the country that schools can take part in'.

Measures

Norm evaluation

After reading their in-group norm and the goal context manipulation, participants were asked 'how okay or not okay is it that your group wants to. . .help other teams in the competition (cooperative norm) . . .not help other teams in the competition (competitive norm)' (1 = really not okay, 5 = really okay).

Resource allocation

Participants were told that their school council had purchased ten boxes of art supplies for the art event. Participants were asked to distribute these art supplies between the two groups by moving boxes to one of two columns marked 'Your School Group' or 'Other School Group'. All ten boxes had to be allocated to complete the task. Participants justified their allocation by answering an open-ended question: 'Why did you split the supplies the way you did?'

Data preparation

Responses to the open-ended reasoning question were coded using categories adapted from Social Domain Theory (Turiel, 1983) and previous research (McGuire *et al.*, 2017, 2018). The coding system assigned responses to one of six categories: (1) Fairness, (2) Equality, (3) Fair Competition, (4) Group Functioning, (5) Goal Context, and (6) Personal Choice (Table 1). Responses that did not fit into one of these categories were coded as 'other'. Analysis of agreement between two coders (one of whom was blind to the hypotheses) across 25% of the responses suggested satisfactory inter-rater reliability (Cohen's $\kappa = .67$). Fewer than 5% of participants used the personal choice categories ($n = 5$), so these responses were omitted, along with the 'other' category ($n = 17$) and participants who did not provide a response ($n = 5$).

Participants' allocation strategy was included as a variable in reasoning analyses. Participants who assigned five boxes to each team were coded as Equality Strategists ($n = 274$). Participants who assigned more boxes to their in-group were coded as In-group Serving ($n = 70$).

Data analytic plan

To test our resource allocation hypotheses and evaluations of the in-group norm, we conducted a series of 2 (age group: children, adolescents) × 2 (in-group norm: competitive, cooperative) × 3 (goal context: group-focused, learning-focused, prosocial) univariate ANOVAs. Reasoning responses were analysed using a multinomial logistic regression model.

Table 1. Social reasoning categories

Category	Example
1. **Fairness**: References to generic fairness	'It's the fair thing to do'
2. **Equality**: References to allocating resources equally between groups	'So the supplies are equal'
3. **Fair Competition**: References to ensuring the event is conducted on a level playing field	'So every team has a chance to win'
4. **Group Functioning**: References to group dynamics, norms or loyalty	'Because that's what the rest of the team wanted to do'
5. **Goal Context**: References to the goal of the event	'Because I wanted the charity to have lots of money and other groups can help by making amazing art'
6. **Personal Choice**: References to autonomy	'It was my decision how to split the boxes'

Results

Resource allocation

Analyses revealed a significant main effect of age group, $F(1, 332) = 12.56$, $p < .001$, $\eta^2 = .04$. Adolescents ($M = 5.70$, $SD = 1.40$) allocated a greater share of resources to their in-group than children ($M = 5.26$, $SD = .78$). Similarly, there was a significant main effect of in-group norm, $F(1, 332) = 4.03$, $p = .05$, $\eta^2 = .01$. Participants in the competitive in-group norm condition ($M = 5.57$, $SD = 1.23$) allocated more resources to their in-group than those in the cooperative in-group norm condition ($M = 5.34$, $SD = .93$). The main effect of in-group norm was qualified by a significant interaction between in-group norm and goal context, $F(2, 332) = 5.15$, $p = .006$, $\eta^2 = .03$ (Figure 1).

When the goal context was prosocial, in-group allocations did not differ between the cooperative ($M = 5.72$, $SD = 1.33$) and competitive ($M = 5.52$, $SD = 1.30$, $p = .27$) in-group norm conditions. In both the cooperative ($t(56) = 4.07$, $p < .001$, Cohen's $d = .54$) and competitive ($t(53) = 2.93$, $p = .005$, Cohen's $d = .40$) conditions, allocations

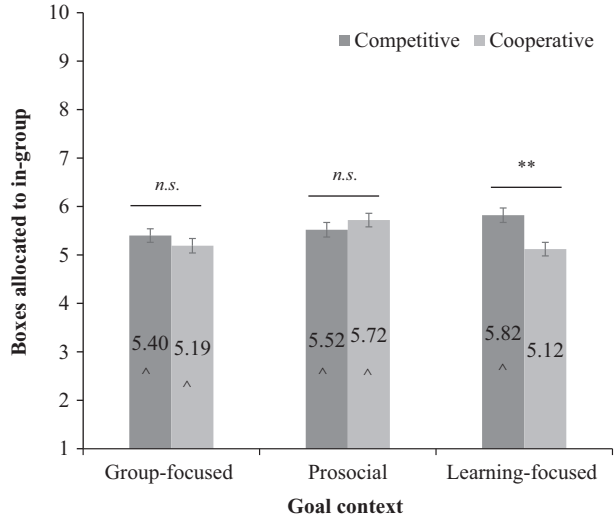

Figure 1. Boxes allocated to in-group as a function of in-group norm and goal context (error bars represent standard error; ^ = differs significantly from mid-point of scale; **$p < .005$).

differed significantly from an equal allocation of five boxes. Providing support for H1, in the prosocial goal context, participants in both norm conditions allocated in favour of their in-group.

In the learning-focused goal context, participants allocated significantly more boxes to their in-group when the norm was competitive (M = 5.82, SD = 1.50) than when the norm was cooperative (M = 5.12, SD = .50, p = .001). In support of H2, it was only in the competitive in-group norm condition that participants' allocations to the in-group differed significantly from an equal allocation of 5 boxes ($t(55) = 4.09$, $p < .001$, Cohen's d = .55). When the goal of the art event focused on learning, and the group held an in-group norm of cooperation, participants allocated resources equally.

Finally, in the group-focused goal context, in-group allocations did not differ in the competitive (M = 5.52, SD = 1.00) and cooperative (M = 5.19, SD = .56, p = .24) in-group norm conditions. Providing partial support for H3, in both the cooperative ($t(53) = 2.33$, p = .02, Cohen's d = .32) and competitive ($t(64) = 3.24$, p = .002, Cohen's d = .40) conditions, participants' allocations to their in-group differed significantly from an equal allocation of five boxes. When the goal context was group-focused, participants allocated a greater share of resources to their in-group than to the outgroup.

Norm evaluation

Analysis of participants' evaluation of the in-group norm revealed a main effect of in-group norm condition, $F(1, 331) = 241.56$, $p < .001$, $\eta^2 = .42$. Participants in the cooperative in-group norm condition (M = 4.13, SD = 1.04) rated their group's norm as more 'okay' than participants in the competitive in-group norm condition (M = 2.17, SD = 1.27). Participants' evaluations of the norm did not differ based on their age or the goal context.

Resource allocation reasoning

To test H5, we used a multinomial logistic regression approach that modelled the effects of age group and allocation strategy across five conceptual categories (fairness, fair competition, equality, group functioning, goal context). The overall model was significant, LR $\chi^2(24, n = 317) = 212.26$, Nagelkerke $R^2 = .51$, $p < .001$. There were significant main effects of both strategy, $\chi^2(4) = 163.12$, $p < .001$ and age group, $\chi^2(4) = 17.27$, $p = .002$. In support of H5, these main effects were qualified by a significant interaction between strategy and age group, $\chi^2(12) = 197.63$, $p < .001$. Given some small cell sizes ($n < 5$), we used Fisher's exact tests and follow-up z tests with Bonferroni corrections applied to examine differences in reasoning as a function of age group and strategy (Table 2). All comparisons reported were significant at the $p < .05$ level, and reported means are proportional percentages of reasoning.

Amongst adolescents, there were significant differences in reasoning style as a function of allocation strategy, Fisher's exact = 84.67, $p < .001$. Adolescents who allocated equally between groups made greater reference to fair competition (M = .38) than fairness (M = .20), equality (M = .21), group functioning (M = .06), or goal context (M = .15). These participants argued that equal allocation would ensure both groups a fair chance in the event: '*I think even though it's a competition we should all be given the same chance and opportunity to make it fair to win*'. By comparison, adolescents who allocated more resources to their in-group made greater use of group functioning justifications (M = .82) than equality (M = .03), or goal context (M = .15). There were no references to fairness or fair competition amongst this group. These adolescents

Table 2. Participants' reasoning about resource allocation decisions as a function of allocation strategy and age

Allocation strategy	Age group	Fairness	Equality	Fair competition	Group functioning	Goal context	Row total
Equality	Adolescents	22 (0.20)	23 (0.21)	41 (0.38)	6 (0.06)	16 (0.15)	108
	Children	51 (0.33)	43 (0.28)	51 (0.33)	4 (0.03)	6 (0.04)	155
In-group	Adolescents	0 (0.00)	1 (0.03)	0 (0.00)	28 (0.82)	5 (0.08)	34
Serving	Children	2 (0.10)	0 (0.00)	0 (0.00)	16 (0.80)	2 (0.10)	20
Column total		75	67	92	55	29	$n = 317$

Note. Reported values represent frequency of reasoning style within allocation strategy condition and proportions in brackets.

referenced the importance of in-group success: '*we want more than an even chance to win, so the other team will need less supplies*'.

Amongst children, there were significant differences in reasoning style as a function of allocation strategy, Fisher's exact = 71.81, $p < .001$. Children who allocated equally made equal reference to fairness ($M = .33$) and fair competition ($M = .33$) and used these justifications more than equality ($M = .28$), group functioning ($M = .03$) or goal context ($M = .04$). Children who allocated equally referenced principles of fairness: '*If I gave more supplies to one team it would be unfair*'. Concerns for fair competition were also present amongst children, who argued that equal allocation was important: '*so it is fair; if we had more than them they could run out of materials*'.

Children who allocated in favour of their in-group justified this with greater reference to group functioning ($M = .80$) than fairness ($M = .10$) or goal context ($M = .10$). There were no references to equality or fair competition amongst this group. These children referenced the importance of group loyalty: '*I don't want to help another school win, other than mine*'.

Crucially and consistent with H5, there were differences in reasoning as a function of age group amongst participants who allocated equally, Fisher's exact = 15.48, $p = .003$. Children justified equal allocation with greater reference to fairness than adolescents. In contrast, we observed greater reference to the goal context amongst adolescents than children.

Discussion

The results of the present study demonstrate that from middle childhood different goal contexts make moral and group concerns more or less salient, which children and adolescents use in conjunction with information about group norms to guide their resource allocation. These findings extend the developmental resource allocation literature by demonstrating that children do not just consider the type of resource they are allocating, or who they are allocating to, but simultaneously coordinate these issues with information about *why* resources are being allocated.

Prosocial goal context

In a prosocial goal context, children and adolescents allocated in favour of their in-group independent of whether their in-group norm was competitive or cooperative. Consistent with our hypotheses, this finding suggests that the prosocial goal context made multi-

faceted concerns salient that were resolved through in-group favouring allocation. The present results suggest that the desire to enhance in-group prosocial reputation by prioritizing a moral concern of welfare is more powerful than the desire to adhere to an in-group norm of cooperation. This is consistent with literature that has demonstrated the importance of prosocial behaviour for children in this age range (Paulus, 2014), as well as resource allocation in prosocial contexts (McGuire *et al.*, 2018). The present findings extend this literature by demonstrating that children and adolescents reconcile a conflict between prosocial goals and intra-group dynamics by seeking to enhance in-group distinctiveness. Future research should explore how much in-group bias children and adolescents perceive to be acceptable in order to achieve a prosocial goal.

Learning-focused context

In a learning-focused context, children and adolescents allocated resources equally when their group supported a cooperative in-group norm. In this context, equal allocation adheres to both the in-group norm and contextual demands. As predicted, the learning-focused goal context made such concerns salient by emphasizing the importance of equal access to schooling supplies (Elenbaas *et al.*, 2016). In contrast, when their group endorsed a competitive norm, participants allocated more to their in-group (McGuire *et al.*, 2017, 2018). Though the context was not competitive, children may still find it hard to interpret any intergroup situation as truly non-competitive especially when the in-group supports competition. These findings suggest that equal allocation is most likely when matched messages about cooperation are present across group and contextual levels. Future research should examine whether a truly *cooperative* goal context (one where both groups must combine efforts to achieve a common goal) could ameliorate in-group bias even when the in-group endorses a competitive norm.

Group-focused context

Third, in a group-focused goal context, participants allocated in favour of their in-group independent of the group norm. This finding aligns with previous research that has demonstrated that competitive in-group norms can lead to in-group biased resource allocation (McGuire *et al.*, 2017, 2018). However, unlike previous work, we did not observe significantly greater in-group biased allocation when the group supported a competitive norm compared to a cooperative norm. This is perhaps surprising since a competitive in-group norm in conjunction with a group-focused goal context may seem like a situation where in-group bias is more acceptable.

However, we know that children are not only concerned with maintaining their individual reputation as moral actors (Rapp *et al.*, 2019), but also with maintaining the *group's* moral reputation (Engelmann *et al.*, 2018). In contrast to the prosocial goal context where in-group biased allocation can be justified on moral grounds, achieving in-group distinctiveness through unfair allocation is not so easily justified. These concerns were evidence in the in-group norm evaluation findings, as participants in the competitive in-group norm condition judged their group's norm to be less 'okay' than those in the cooperative in-group norm condition. Similarly, our reasoning findings demonstrated that adolescents in particular reference the importance of fair competition. That is, winning from a position of initial advantage is not desirable. Together, concerns for reputation and fair competition can help

explain why excessive in-group bias was not observed when the in-group endorsed a competitive norm in the group-focused goal context condition. Further work is required that examines the when competitive in-group serving behaviour is acceptable (e.g., McGuire *et al*., 2017) or not as shown here.

Developmental trends

Adolescents who allocated resources equally made greater reference to fair competition and situated their decision-making with the context by referencing the prosocial and learning-focused goal contexts when justifying their allocation. Children predominantly reasoned about concerns for fairness without specific reference to the context of the allocation decision, as in comparable work (McGuire *et al*., 2019; McGuire *et al*., 2017; McGuire *et al*., 2018). These findings suggest a developmental trend between childhood and adolescence in complex intergroup resource allocation contexts. This reasoning process differentiates and underlies children's and adolescents' decision-making even when they allocate resources using the same strategy. Future work should examine how adolescents who have greater experience of complex intergroup contexts (e.g., belonging to extra-curricular clubs) use these experiences to guide their contextual reasoning and decision-making. These findings fit with the predictions of the SRD model (Rutland & Killen, 2017) by demonstrating that with age children coordinate moral and group concerns. Importantly, the present study extends this literature by documenting that from 9 years old, children are capable of attenuating displays of overt in-group bias in a goal-specific manner.

Together, these findings are relevant to the developmental resource allocation literature. Children move from self-interest to fair or equitable allocation in middle childhood (Fehr, Bernhard, & Rockenbach, 2008; Kogut, 2012; Smith, Blake, & Harris, 2013). However, studies in this area often involve interpersonal exchange of toys or sweets for individual (or third-party) use (Blake & Rand, 2010; Shaw, DeScioli, & Olson, 2012; Shaw & Olson, 2012). While these studies make the important point that children understand and utilize fairness, the present work qualifies this by demonstrating that equality is most likely when group concerns are not salient (i.e., learning-focused context coupled with a cooperative in-group norm). In contrast, when asked to allocate situationally relevant resources between groups in a prosocial context, children understand that in-group favouring allocation may not necessarily be an expression of inappropriate in-group bias but can reflect the means to aiding the welfare of needy others.

Limitations & future research

The level of participant dropout is a limitation of the present work. There are two possible explanations for this. First, the research was conducted in full classroom groups, putting demands on children's reading abilities. Second, research has suggested that children are especially prone to projecting their own norms and values on to the perceived norms and values of the group (Thijs & Verkuyten, 2016). Future work in this area would benefit from one-to-one interviewing with younger participants, as well as greater use of pictorial aides to bolster children's understanding and attention. Further, measuring children's baseline perception of resource allocation norms would allow us to control for the possibility of social projection in paradigms where in-group norms are manipulated.

While we observed differences in resource allocation and reasoning, estimates of practical effect size (partial eta squared) suggested that these effects were predominantly small to medium (Miles & Shevlin, 2001). This suggests that there is further work to be done to determine how important goals and norms are in children's and adolescents' resource allocation outside of experimental manipulations. Further, the coding framework used here was based on existing theory and experimental work (McGuire *et al.*, 2019; Turiel, 1983) but did not achieve strong inter-rater reliability. It will be important for future work to establish the extent to which children and adolescents reference contextual issues in their reasoning justifications outside of these specific experimental manipulations.

Future research should also pick apart differences in how children and adolescents think about prosocial contexts. Here, we observed differences in reasoning based on age. Some adolescent participants believed that the charity event required cooperation, while others allocated in favour of their group. It would be interesting to explore how perceptions of in-group competence or morality (Cuddy, Fiske, & Glick, 2008) and in-group identification (Nesdale, Durkin, Maass, & Griffiths, 2005) impact on decisions to allocate equally or in favour of the in-group in a prosocial context. One possibility is that participants who identify highly with and believe their in-group to be highly competent *and* moral may be most likely to demonstrate in-group bias to achieve a prosocial goal. Further, additional evaluative dependent variables would extend our understanding of the possible social-cognitive moderators of children's resource allocation decisions. For example, participants' evaluations of how okay it is to favour one's in-group in the three goal contexts and their reasoning justifications for this would provide interesting insight to expand our understanding of the coordination of moral and group concerns in different goal contexts.

Conclusion

The present study has important implications for situations in which prosocial and moral goals may conflict with competitive intergroup norms. Such conflicts may be especially salient where intergroup inequality exists and competition for limited necessary resources is high. Efforts to advance prosocial causes will require the promotion of ideals of fair competition alongside recognition that individuals are often members of groups who, on some level, are competing to promote their group identity.

Author contributions

Luke McGuire (Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Writing – original draft; Writing – review & editing) Adam Rutland (Conceptualization; Methodology; Supervision; Writing – review & editing).

Conflict of interest

All authors declare no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

The following supporting information may be found in the online edition of the article:

Table S1. Number of participants excluded from analyses as a function of gender, age group, in-group norm and goal context.